Pont Briwet :
Penrhyndeudraeth, Gwynedd

Cultural Heritage Assessment (DMRB)

GAT Project No. 2144
Report No. 894
October, 2010

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Gwynedd Archaeological Trust
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Prepared for

Gwynedd Consultancy

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By

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G2144 PONT BRIWET, PENRHYNDEUDRAETH

ARCHAEOLOGICAL ASSESSMENT

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SUMMARY

An archaeological desk-based assessment has been carried out according to guidelines given in 'Design Manual for Roads and Bridges, Volume 11, Section 3', at Pont Briwet, Penrhyndeudraeth and surrounding land. The bridge crosses the wide expanse of Traeth Bach, being the estuary of the Afon Dwyryd. It was one of a number of timber viaducts opened in 1867 to carry the west coast section of the Cambrian Railways from Glan Dovey Junction to Pwllheli. It was noted to be of almost entirely wooden construction, with the exception of rough slate abutments and metal bands and bolts, and to consist of 21 piers of five piles, with a cross head of timber and diagonals with four or five piles, upon which the carriageway was laid. Many of the original timbers have been replaced in the 1930s and also subsequently. Associated with the bridge is a 19th century toll house, along with gate piers that held the former toll gate across the road. The bridge is considered to be of 'High' archaeological importance, and it is recommended a detailed archaeological record is made prior to any impact.

A possible wharf to the south west of the bridge, which may have been the landing stage of the former ferry across Traeth Bach was located. Groynes, of probable 20th century date, were noted to be protecting the west side of the bridge.

To the north of the bridge the proposed road improvements will impact upon boundary walls of 19th century and later date, as far as Cambrian View, opposite Penrhyndeudraeth Station, although the impact on the surrounding buildings and three listed buildings somewhat more distant, is considered to be minimal. To the south the improvements will impact on land reclaimed from Traeth Bach in the late 18th or early 19th century, where the potential for the identification of new archaeological sites is considered to be low.

No field archaeological evaluation is recommended, but a watching brief is recommended during the initial phase of ground works associated with the road improvements.

1 INTRODUCTION

Gwynedd Archaeological Trust (GAT) was asked by Cyngor Gwynedd Council to carry out a Cultural Heritage assessment in advance of the upgrading of the Pont Briwet railway bridge (NGR SH 61913829) and improvements to the associated approach roads either side. The report forms part of the Environmental Impact Assessment (EIA) being prepared for the scheme. Network Rail/Cyngor Gwynedd Council's proposals involve an application for Listed Building Consent for the demolition of the Pont Briwet viaduct, and its replacement with a new fit for purpose rail and road structure.

1.1 Acknowledgements

The staffs of Gwynedd Archives, Dolgellau and the National Library of Wales are thanked for their help with providing archive material. Victoria Shaw at the National Railway Museum, York is thanked for her advice. Ashley Batten of Gwynedd Archaeological Planning Service (GAPS) is thanked for his help and guidance. Colin Field of Network Rail is acknowledged for bringing information about the Welsh wooden railway viaducts to the attention of the author.

2 SPECIFICATION AND PROJECT DESIGN

The basic requirement was for a desk-top survey and field search of the corridor of interest in order to assess the impact of the proposals on the archaeological and heritage features within the road corridor and close enough to it to be affected. The importance and condition of known archaeological remains were to be assessed and areas of archaeological potential and new sites to be identified. Measures to mitigate the effects of the road scheme on the archaeological resource were to be suggested.

The present assessment is based upon the guidelines set out in Design *Manual for Roads and Bridges Volume 11, Section 3, Part 2* (August 2007) and also as set out in *Standards and Guidance: Desk-based*

Assessments (Institute For Archaeologists, 1994, revised 2001), and *Guide to Good Practice on Using the Register of landscapes of Historic Interest in Wales in the Planning and Development Processes* (Cadw 2007 version: 2 – henceforth Good Practice). The study area consists of the area of the proposed scheme, as shown on figure 1, and a 100m corridor surrounding it.

Gwynedd Archaeological Trust's proposals for fulfilling these requirements were as follows:

a) to identify and record the cultural heritage of the area to be affected
b) to evaluate the importance of what was identified (both as a cultural landscape and as the individual items which make up that landscape)
c) to recommend ways in which damage to the cultural heritage can be avoided or minimised

A full archaeological assessment usually comprises six phases:

1) Desk-top study
2) Field Search
3) Interim Draft Report
4) Detailed Field Evaluation
5) Final Draft Report
6) Final Report

This assessment has covered the work required under 1, 2 and 3. It is sometimes necessary to undertake a programme of field evaluation following the desktop assessment. This is because some sites cannot be assessed by desktop or field visit alone, and additional fieldwork is required. This typically takes the form of geophysical survey and trial excavation, although a measured survey is also an option. The present report makes recommendations for any field evaluation required.

It should be noted that full details of ancillary areas likely to be affected by the bridge and road works, such as vehicle parking and turning areas, materials storage areas etc., have not yet been supplied. Experience shows that these areas are as likely to suffer damage as the actual land-take for the road. If all such areas fall within the corridor of interest, they will have been covered, but in order that all areas affected may be subjected to the same level of survey, any information relating to areas affected outside the 100m corridor should be notified to the Trust as soon as possible.

For areas identified as Landscapes of Historic Interest in Wales by Cadw, ICOMOS and the Countryside Council for Wales, it is required that archaeological assessments answer the requirements of an ASIDOHL (Assessment of the Significance of the Impact of Development on Historic Landscapes). The constituents of such an instrument are identified in 3.3 below. This is provided as a separate report.

2.1 Regulatory / Policy Framework

The European Union Council Directive 85/337/EEC, amended by Directive 97/11/EC, requires the preparation of an Environmental Impact Assessment (EIA) for certain types of projects likely to have significant effects on the environment. This helps to ensure that the predicted effects and the scope for reducing them are properly understood by the relevant authorities, statutory consultees and general public. The Town and Country Planning (Assessment of Environmental Effects) Regulations, 1999 (SI No. 369) interpret these Directives. Under these Regulations, a highway scheme such as a motorway widening or new bypass may require an Environmental Impact Assessment (EIA). In accordance with the Schedules to the Regulations and Directive it has been determined that an EIA is required for this highway scheme.

The framework for the protection of archaeology in Wales within the planning process is provided by Welsh Office Circular 60/96 'Planning and the Historic Environment: Archaeology' in conjunction with Planning Policy Wales and Welsh Office Circular 61/96 'Planning and the Historic Environment: Historic Buildings and Conservation Areas'. These have been supplemented more recently with *Conservation*

Principles for the sustainable management of the historic environment in Wales (Cadw, Welsh Assembly Government, 2011).

Current regional and local plan policies are defined in *Gwynedd Structure Plan* (adopted 1993) and, for the National Park, *Eryri Local Plan* (adopted 1999), and Eryri Local Development Plan (deposited Spring 2009). Policies concerning archaeology in the *LDP*, are given in section 4: Protecting and Enhancing Cultural and Historic Environment.

The Gwynedd Structure Plan (1991-2006), was partly superseded by the Gwynedd Unitary Development Plan (UDP) in 2009. This embodies policies relating to transport and the countryside within Gwynedd and the Snowdonia National Park, including nature conservation, tourism, recreation and agriculture.

The Structure Plan and the UDP (Policy B7) state that the developer will be required to commission either an archaeological assessment and/or field evaluation in order to determine the archaeological impact of a proposed development. Appropriate mitigation should also be recommended. This report fulfils these requirements.

3 METHODS AND TECHNIQUES

3.1 Desk-top Study

The *Design Manual for Roads and Bridges Volume 11, Section 3, Part 2 Chapter 2* sets out the considerations by which the cultural heritage resource should be assessed. The following topics were considered:

- The presence or absence, character, condition, setting and value of archaeological remains, historic buildings, and historic landscapes
- All designations related to cultural heritage, including those where cultural heritage values may play a part in a broader citation (e.g. Areas of Outstanding Natural Beauty, National Parks, etc.);
- Historical legibility (i.e. the way in which a historic monument or landscape can be 'read' through an understanding of the development of its features, character, setting and context through time);
- Time-depth and phases of development (i.e. the evidence for the character and processes of change on a site or landscape over time)

Consultation of maps, computer records, written records and reference works, which make up the Historic Environment Record (HER), was undertaken at Gwynedd Archaeological Trust. Primary Record Numbers (PRNs) are the unique reference numbers given to each site on the HER. Records (including early Ordnance Survey maps, tithe maps and schedules, estate maps and papers and reference works - see bibliography) were also consulted in the library and the archives of the University of Wales, Bangor, and the county archives at Dolgellau. Aerial photographs were inspected at the National Monuments Record, Aberystwyth and two aerial photographs were obtained from the Central Register of Aerial Photographs in Cardiff.

3.2 Field Search

The field search was undertaken during September 2010, when the area of the proposed development was examined. Notes were taken, sketches and measurements were taken of sites of potential archaeological interest and a photographic record was made. Weather and ground conditions were good for a site visit, and no problems were encountered during the search.

Sites identified were marked on copies of 1:2,500 OS maps, as accurately as possible without surveying. Forms were filled in assessing each site, and detailed notes made of the more important ones. Photographs were taken of all potential sites identified.

3.3 Landscape assessment

The proposed scheme falls partly within the Ardudwy Landscape of Outstanding Historic Significance, as set out in the ICOMOS/Cadw/Countryside Council for Wales Register of Landscapes of Outstanding Historic Interest in Wales (Cadw/ICOMOS 1998; Ardudwy HLW (Gw) 2, No. 20).

The latest guidance on the use of the Register is set out in Welsh Office Planning Guidance (Wales): First Revision (April 1999), para. 5.6.10 and in National Assembly for Wales Public Consultation, Draft Planning Policy Wales, February 2001, para. 8.4, both of which state:

Information on the landscapes on the second part of the Register should also be taken into account by local planning authorities in preparing development plans, and in considering the implications of developments which are of such a scale that they would have more than a local impact on an area on the Register.

The developments include a major transport scheme, which therefore requires the application of part or all of the ASIDOHL process.

A Historic Landscape Characterisation (HLC) was carried out over the area of the Vale of Ffestiniog and Ardudwy (GAT 2003a and b).

3.4 Report

All available information was collated, and transferred onto a single set of maps at a scale of 1:2,500 for convenience. The sites were then assessed and allocated to the categories listed below. These are intended to give an idea of the importance of the site and the level of response likely to be required; descriptions of the sites and specific recommendations for further evaluation or mitigatory measures, as appropriate, are given in the relevant sections of this report. In some cases, further investigation may result in sites being moved into different categories.

3.5 Assessment of the value of archaeological assets

3.5.1 The value of the archaeological assets

All archaeological sites should be assessed for value, and allocated to one of the categories listed below. The allocation of a site to a category defines the value of the archaeological resource of that site. The criteria are taken from the DMRB Cultural Heritage Resource values as defined in the *DRMB Volume II, Section 3, Part 2, Chapter 5*, sections 5.25-5.44. The DMRB guidelines reference Welsh Office Circular 60/96; Welsh Office Circular 61/96 and Welsh Office Circular 1/98 for the purposes of assessing Listed Buildings and Scheduled Ancient Monuments. More recent guidelines on assessment of cultural heritage assets have been provided in *Conservation Principles for the sustainable management of the historic environment within Wales.* (Cadw 2011).

Table 1: Factors for assessing the value of archaeological assets

Very High	• World Heritage Sites (including nominated sites). • Assets of acknowledged international importance. • Assets that can contribute significantly to acknowledged international research objectives. (Previously Category A)
High	• Scheduled Monuments (including proposed sites). • Undesignated assets of schedulable quality and importance. • Assets that can contribute significantly to acknowledged national research objectives. (Previously Category A)

Medium	• Designated or undesignated assets that contribute to regional research objectives. (Previously Category B)
Low	• Designated and undesignated assets of local importance. • Assets compromised by poor preservation and/or poor survival of contextual associations. • Assets of limited value, but with potential to contribute to local research objectives. (Previously Category C)
Negligible	• Assets with very little or no surviving archaeological interest. (Previously Category D)
Unknown	• The importance of the resource has not been ascertained. (Previously Category E)

3.5.2 Magnitude of impacts

The definition of impacts on the cultural heritage are defined as follows (DMRB 2007 Volume 11, Section 3, Annex 5, Section 5.12)

Table 2: Factors in the Assessment of Magnitude of Impacts

Major	Change to most or all key archaeological materials, such that the resource is totally altered. Comprehensive changes to setting.
Moderate	Changes to many key archaeological materials, such that the resource is clearly modified. Considerable changes to setting that affect the character of the asset
Minor	Changes to key archaeological materials, such that the asset is slightly altered. Slight changes to setting
Negligible	Very minor changes to archaeological materials, or setting
No Change	No change

The value of an archaeological asset refers to both the physical remains and information inherent in the site. If a site is excavated in advance of destruction the physical remains will be destroyed but the information will have been retained. This is termed "Preservation of Archaeological Remains by Record" in Planning and the Historic Environment: Archaeology (Welsh Office Circular 60/96). It should be noted that even though this is seen as a valid mitigatory measure, preservation *in situ* is the preferred option.

3.5.3 The significance of effect

The significance of effect is derived from the importance of the resource and the magnitude of the impact upon it. Archaeological value Unknown sites are not included because they would have been reassigned to another category by the end of the assessment and evaluation.

Very large - A serious impact on a site of international or national importance with little or no scope for mitigation. These effects represent key factors in the decision making process.

Large - Lesser impacts on sites of national importance and serious impacts on sites of regional importance, with some scope for mitigation. These factors should be seen as being very important considerations in the decision making process.

Moderate - Moderate or minor impacts on sites of regional importance and minor to major impacts on sites of local or minor importance. A range of mitigatory measures should be available.

Slight - Negligible impacts on sites of regional, local or minor importance and minor and moderate impacts on minor or damaged sites. A range of basic mitigatory measures should be available.

Neutral - No perceptible effect or change to sites of all categories.

The significance of effect will be determined using Table 3, a basic matrix combining archaeological value and magnitude of impact.

Table 3: Determination of Significance of Effect (DRMB 2007, Annex 5, Sections 5.13-5.14)

	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
Archaeological Value	**High**	Neutral	Slight	Moderate or Slight	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
		Magnitude of impact				

3.5.4 Definition of Mitigation Measures

The alignment of the Proposed Improvement avoids as far as possible sites of archaeological interest. Where a site is affected, mitigation measures would be required in accordance with the guidelines in DMRB Volume 10 and Interim Advice Note (IAN) 81/06.

The following are the basic categories of archaeological mitigation measures which will be used. Additional details may be added in regard to the setting of archaeological sites. The detailed recording, basic recording and watching brief options fulfil the "preservation by record" option described in Welsh Office Circular 60/96.

None - No impact, so no requirement for mitigation measures.

Detailed recordin**g** - Detailed recording requires a photographic record, surveying and the production of a measured drawing prior to the commencement of the works on site. Archaeological excavation works may also be required, depending upon the particular feature and the extent and effect of the impact.

This may entail full excavation and recording where a known site will be destroyed or partially destroyed by the scheme. Some built sites would require dismantling by hand, to provide a detailed record of the method of construction and in the case of a listed structure, the salvage of materials for re-use and re-building.

For wider areas of high archaeological potential there are three main options:

S*trip map and sample*: This technique involves the examination of machine-stripped surfaces to identify archaeological remains. The process of machine stripping would be supervised by an archaeologist. Once stripping has been undertaken, areas of archaeological potential would be identified and cleaned by hand. Sample areas would be cleaned by hand in apparently negative areas to act as a control. Where complex archaeological deposits are identified during stripping, these would be identified at an early stage in order to formulate a defined area of work. This technique relies upon the recognition of features by plan, and excavation of features would be kept to a level required to assess the nature and importance of the remains. This would be followed by full excavation where appropriate.

Basic recording - Recording by photograph and description requires a photographic record and written description prior to the commencement of works on site. A measured survey may be required in certain cases.

Watching brief - Observation of particular identified features or areas during works in their vicinity. This may be supplemented by detailed or basic recording of exposed layers, structures or sections.
Avoidance - Features which may be affected directly by the scheme, or by the construction of the scheme, should be avoided.
Reinstatement and/or relocation – The feature should be reinstated with archaeological advice and supervision.

3.5.5 Definition of field evaluation techniques

Field evaluation is necessary to allow the reclassification of sites of unknown Archaeological Value and to allow the evaluation of areas of land where there are no visible features, but for which there is potential for sites to exist. Two principal techniques can be used for carrying out the evaluation: geophysical survey and trial trenching.

Geophysical survey
This technique involves the use of a magnetometer, which detects variation in the earth's magnetic field caused by the presence of iron in the soil. This is usually in the form of weakly magnetised iron oxides, which tend to be concentrated in the topsoil. Features cut into the subsoil and back-filled or silted with topsoil contain greater amounts of iron and can therefore be detected with the gradiometer. Strong readings can be produced by the presence of iron objects, and also hearths or kilns.

Other forms of geophysical survey are available, of which resistivity survey is the other most commonly used. However, for rapid coverage of large areas, the magnetometer is usually considered the most cost-effective method. It is also possible to scan a large area very rapidly by walking with the magnetometer, and marking the location of any high or low readings, but not actually logging the readings for processing.

Trial trenching
Buried archaeological deposits cannot always be detected from the surface, even with geophysics, and trial trenching allows a representative sample of the development area to be investigated. Trenches of an appropriate size can also be excavated to evaluate unknown sites. These trenches typically measure between 20m and 30m long by 2m wide. The turf and topsoil is removed by mechanical excavator, and the resulting surface cleaned by hand and examined for features. Anything noted is further examined, so that the nature of any remains can be understood, and mitigation measures can be recommended.

3.6 Historic Buildings

3.6.1 Assessment of the value of Historic Buildings

The evaluation of the value of the built heritage resource uses the categories and criteria shown in table 4. They are based on the criteria given in the DMRB Cultural Heritage Resource values as defined in the *DRMB Volume II, Section 3, Part 2, Annex 6,* section 6.10

Table 4: Guide for Establishing the Value of Historic Buildings

Criteria for Establishing the Value of Historic Buildings	
Very High	• Structures inscribed as of universal importance as World Heritage Sites. • Other buildings of recognised international importance.
High	• Scheduled Monuments with standing remains. • Grade I and Grade II* (Scotland: Category A) Listed Buildings. • Other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade. • Conservation Areas containing very important buildings. • Undesignated structures of clear national importance.

Medium	• Grade II (Scotland: Category B) Listed Buildings. • Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. • Conservation Areas containing buildings that contribute significantly to its historic character. • Historic Townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Low	• 'Locally Listed' buildings (Scotland Category C(S) Listed Buildings). • Historic (unlisted) buildings of modest quality in their fabric or historical association. • Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Negligible	• Buildings of no architectural or historical note; buildings of an intrusive character.
Unknown	• Buildings with some hidden (i.e. inaccessible) potential for historic significance.

3.6.2 Magnitude of impacts

The magnitude of impact or change is graded using the criteria shown in table 5. They are based on the criteria given in the DMRB Cultural Heritage Resource values as defined in the *DRMB Volume II, Section 3, Part 2, Annex 6,* section 6.11

Table 5: Factors in the Assessment of the Magnitude of Impacts

Factors in the Assessment of Magnitude of Impacts	
Major	Change to key historic building elements, such that the resource is totally altered. Comprehensive changes to the setting.
Moderate	Change to many key historic building elements, such that the resource is significantly modified. Changes to the setting of an historic building, such that it is significantly modified.
Minor	Change to key historic building elements, such that the asset is slightly different. Change to setting of an historic building, such that it is noticeably changed.
Negligible	Slight changes to historic buildings elements or setting that hardly affect it
No change	No change to fabric or setting.

3.6.3 The significance of effect

The significance of the effect of the proposed improvement is considered in terms of the magnitude of the impact arising from the proposed improvement in relation to the value or sensitivity of the receptor. This is determined using the following matrix

Table 6: Significance of effects matrix

	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
Archaeological Importa	**High**	Neutral	Slight	Moderate or Slight	Moderate or Large	Large or Very Large

	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
		Magnitude of impact				

3.7 Historic Landscapes

3.7.1 Assessment of the value of Historic Landscapes

The criteria for the assessment of the value of historic landscapes are defined in *DRMB Volume II, Section 3, Part 2, Annex 6,* section 7.10.

Table 7: Value of the Historic Landscape

Criteria for establishing the value of Historic Landscape Character Units	
Very High	• World Heritage Sites inscribed for their historic landscape qualities. • Historic landscapes of international value, whether designated or not. • Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	• Designated historic landscapes of outstanding interest. • Undesignated landscapes of outstanding interest. • Undesignated landscapes of high quality and importance, and of demonstrable national value. • Well preserved historic landscapes, exhibiting considerable coherence, time-depth or other critical factor(s).
Medium	• Designated special historic landscapes. • Undesignated historic landscapes that would justify special historic landscape designation, landscapes of regional value. • Averagely well-preserved historic landscapes with reasonable coherence, time-depth or other critical factor(s).
Low	• Robust undesignated historic landscapes. • Historic landscapes with importance to local interest groups. • Historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	• Landscapes with little or no significant historical interest.

3.7.2 Magnitude of impacts

The magnitude of impact or change is graded using the factors shown in table 8

Table 8: Magnitude of Impact: Summary of Factors

Factors in the Assessment of Magnitude of Change	
Major	Change to most or all key historic landscape elements, parcels or components; extreme visual effects; gross change of noise or change to sound quality; fundamental changes to use or access; resulting in total change to historic landscape character unit.
Moderate	Changes to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, noticeable differences in noise or sound quality, considerable changes to use or access; resulting in moderate changes to historic landscape character.
Minor	Changes to few key historic landscape elements, parcels or components, slight visual changes to few key aspects of historic landscape, limited changes to noise levels or sound quality; slight changes to use or access: resulting in limited changes to historic landscape character.
Negligible	Very minor changes to key historic landscape elements, parcels or components, virtually unchanged visual effects, very slight changes in noise levels or sound quality; very slight changes to use or access; resulting in a very small change to historic landscape character.
No change	No change to elements, parcels or components; no visual or audible changes; no changes arising from in amenity or community factors.

3.7.3 The significance of effect

The significance of the effect of the proposed improvement is considered in terms of the magnitude of the impact arising from the proposed improvement in relation to the value or sensitivity of the receptor this is determined using the following matrix

Table 9: Significance of effects matrix

	Very High	Neutral	Slight	Moderate or Large	Large or Very Large	Very Large
Importance	**High**	Neutral	Slight	Moderate or Slight	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral	Neutral or Slight	Neutral or Slight	Slight
		No Change	**Negligible**	**Minor**	**Moderate**	**Major**
		Magnitude of impact				

4 ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

4.1 Topographic description

Pont Briwet is located across Traeth Bach between Penrhyndeudraeth and Llandecwyn at NGR SH 61933836-6192382 at the point where the Afon Dwyryd broadens into a sandy estuary (Figs. 1-2). The estuary was formerly salt marsh, forming part of the broad estuary of the Afon Dwyryd, but had been encroached upon by the third quarter of the 18th century. The estuary has been reduced by the construction of artificial embankments as well as by the presence of salt marsh. At low tide the river meanders in a trickle through a vast expanse of sand. The bridge is situated on low lying ground at about 5m OD on land south of Penrhyndeudraeth with its abutment on the land of the former Hafod y Wern farm at its northern end, and at the foot of the rocky out crop of Y Garth to the south, in the modern community of Talsarnau, and the historic parish of Llandecwyn. It formed the crossing point of Traeth Bach on the Cambrian Railway between Penrhyndeudraeth and Llandecwyn halt, being originally built in 1865.

4.2 Archaeological and historical background

4.2.1. Earlier Prehistoric

No early prehistoric sites are known within 500m of the study area, and the study area itself is likely to have been under water or formed an area of salt marsh, as part of the Dwyryd estuary. In the wider area there are a number of prehistoric sites on the higher ground to the east and south of the study area. A possible Bronze Age burnt mound is located at Caerwych (PRN 4163; SH63733665) and a Ring Cairn is located south west of Y Gyrn (PRN 1021). A possible prehistoric cairn is located at Nyth y Gigfran (PRN 4177; SH62373888), identified in the *Royal Commission* volume of 1921, although this is possibly a more recent sheep shelter, as shown on the later Ordnance Survey maps (Figs 5-6).

4.2.2 Late Prehistoric / Romano-British

A probable late prehistoric or Romano-British hut circle and associated enclosure (PRN 6152, NGR SH62293803) is located on Y Garth, overlooking the study area from the north. Substantial evidence for late prehistoric enclosed and unenclosed settlement survives on the higher ground to the east and south of the study area, which includes the hut circle and enclosure at Coety Mawr (PRN 1026; SH63103603), Coety Bach (PRN 1027; SH63023615) which are Scheduled Ancient Monuments, and at Maes y Caerau (PRN 1028; SH63503621).

4.2.3 Medieval

The parish of Llanfihangel was a chapel of ease to the church at Llandecwyn, in 1512 the benefice is described as *Llandecwyn cum capella de St. Michael* (Pryce 1923, 13). The two parishes have often subsequently been considered together, as for example in the tithe map of 1842 (Figs. 3 and 4), and the parish boundary appears not to be an ancient one, as it cuts across earlier field boundaries (Fig. 3) further suggesting they were often treated as one. An ancient lane, thought possibly to be medieval in origin, passed south from Llanfrothen to Traeth Bach via Penrhyndeudrath (NGR SH 61183866); it can be seen on the tithe map to the west of the location of Pont Briwet (Fig. 3), and probably represents the location of an ancient crossing point of the Traeth (RCAHMW 1921, 161), and is now a minor road.

4.2.4 Post-Medieval and Early Modern

There are a number of farmsteads in the vicinity of the study area that probably originate in the 16th and 17th centuries. These include Borth Las (PRN 28187), and also Ty Newydd (PRN 28837), which formed part of the estate of Cae Nest, Llanbedr owned by the Poole family. These houses may retain some post-medieval fabric, and were well established estate farms by 1770.

In the post medieval period the estuary of the Dwyryd and Traeth Bach became focal points in the trans shipment of slates brought from Ffestiniog. The slates were initially brought on pack mules and carts from

Ffestiniog down to quays on the Afon Dwyryd, where they were loaded onto small boats and taken to Ynys Cyngar and transferred to sea going ships. The earliest evidence for slate roofing material in the area is between 1575 and 1580, but this is likely to have been from small scale quarries sporadically tapped for local needs. The first evidence for the transport of slate comes from 1750 (Lewis 1989, 17). Larger scale production at Ffestiniog began around 1760, and between then and the transfer of the transhipment point to Porthmadog after the harbour was created there in 1824, and the opening of the Ffestiniog Railway in 1836, the traffic on the Afon Dwyryd was crucial to the process of exporting slate (*ibid*, 9).

In 1810 a turf sea wall was constructed from the hamlet of Glanywern to Briwet on the south shore of Traeth Bach, over a distance of about three miles (Lloyd 1958, 141). The building of these embankments had a significant effect on the local economy and enabled hundreds of hectares of good arable land to be reclaimed and drained, which in turn improved the construction of the railway and Pont Briwet between 1865-7, and also encouraged building work on the railway, particularly south of Pont Briwet.

A number of wharves were constructed on the Dwyryd, the oldest of which was at Cemlyn, near Maentwrog (NPRN 91,425; SH65994011), also the property of the Poole family of Cae Nest, which is known to have been in operation by 1760. The import side of the trade on the Dwyrd was initially dominated by limestone and culm (slack to burn the limestone), which was converted to lime in limekilns for use in both building and agriculture. At least seven of these were located on the Dwyryd, including one at Cemlyn (*ibid.*, 23). During the early to middle part of the 19th century a number of other quays were constructed on the Dwyryd, including one at Cei Newydd (PRN 20,671; SH62703870) opened in 1836 and Cei Gelli Grin (PRN 20,672; SH63903960) in 1834. A probable wharf for the passenger ferry across the estuary which served the area prior to the building of Pont Briwet has been identified during the walk over survey (Feature 2).

An insight into the workings of the transhipping trade is given by Richard Fenton who visited the area in 1804 and stated that he 'strolled under Tan y Bwlch House as far as the estuary, and returned along the embankment on the opposite side of the river wharf, on which lay vast quantities of a delicate blue slate of all sizes, ready for shipping…Vessels of 200 tons come up the river to be loaded at spring tides, and the slates are sent down in boats from the wharf to them' (Fenton 1917, 50).

4.2.5 Modern

4.2.5.1 Developments in land ownership

At the northern end of the bridge, at Penrhyndeudraeth, the land across which the bridge and access road crossed was the property of John Ellerker Boulcott Esq. of Hendre Issa. It formed part of Hafod y Wern Farm and was bought by him at auction in 1803 (X/Poole/2836). He was a prominent figure in Merionydd society and was High Sheriff of the county in 1836 (Gwynedd Archives ZQS E1836/22). The field pattern remained in part until the construction of Cooke's Explosive Works, and field 1145, from which the northern abutment of the bridge springs, was known as *Brewet Mawr*, suggesting the name for the bridge was taken from the local place name (Tithe Schedule, Gwynedd Archives, Dolgellau; Fig.3). The slate abutments of the Pont Briwet are located on the edge of the estuary.

The study area at the southern end of the bridge remained part of the Poole Estate of Cae Nest, owned by Richard Anthony Poole, a Caernarfon attorney, from 1770 to 1842 (Tithe Schedule, Gwynedd Archives, Dolgellau; Fig. 4, Estate map, Fig. 7). The field pattern which survives today had been largely created following land reclamation within the Traeth, and the construction of the Turnpike road between Maentwrog and Harlech in 1833, which led 'along the Dolorean valley to Llandecwyn and down to Felenrhyd bridge near to Maentwrog (Lloyd 1958, 138). An original mile post survives on this road (LB 83457; SH62393792).

Land ownership and fields present in 1842, and noted on the tithe map of the parishes of Llanfihangel y Traethau and Llandecwyn is as noted in the table below (Fig. 4). The land on both sides of the traeth was in the parish of Llanfihangel y Traethau, and the fields close to the Pont Briwet and the assessment area are noted in the table below.

The field patterns around the study area remain largely unchanged from the time of the 1st edition 25 inch Ordnance Survey map of 1889 (Fig. 5) until the present time. In 1897 the present civil parish of Penrhyndeudraeth was carved out of Llanfihangel y Traethau (Lloyd 1958, 137).

Table 10: Tithe Schedule of Penrhyndeudraeth and North Side of Traeth Bach (Fig. 3)

Landowner	**Occupier**	**Plan Nos**	**Name and Description of Land and Premesis**	**State of Cultivation**	**Quantities in Statute Measures** **A R P**
			Tyddyn Isa		
Howell Lloyd	Owen lloyd	1425a	Part of Garth Isa	Pasture	3 24
		1425	Gors Isa	Pasture	49 - 18
		1432	Part of Garth Ganol	Pasture	13 - 32
		1433	Garth Ganol	Pasture	44 1 16
		1443	Nyth y Gig fran	Pasture	5 1 10
			Hafod y Wern		
John Ellerker Boulcott Esq.	John James Barton Esq.	1434	Part of Gors gron	Pasture	26 3 7
		1441	Part of Werglodd Fawr	Pasture	10 1 32
		1442	Tyddyn Nyth y Gigfran	Pasture	2 - 6
		1444	Part of Gors Gron	Pasture	14 2 27
		1445	**Brewet Mawr**	**Pasture**	**15 1 14**
		1445a	Meadow	Pasture	2 - 12
		1446	Garth Ucha	Pasture	10 1 -
		1447	Garth Ucha	Pasture	9 3 22
		1448	Werglodd Gwair	Meadow	13 2 27
		1449	Part of Werglodd Fawr		
		1450	Cae Canol	Arable	4 2 9
		1450a	House and Gardens	House and Garden	- 1 3
		1451	Ddol House &c	Arable	5 1 28
		1452	Werglodd Bach	Arable	- 2 17
		1453	Part of Cefn Hir	Wood	14 2 8
		1457	Werglodd Ging	Meadow	3 2 7
		1457a	Garth isa	Pasture	19 - 4
		1457b	Ffrydd	Pasture	4 - -
		1458	Cae Tan Ty	Arable	7 3 3
		1459	Yt Ochr	~~Arable~~Wood	1 2 11
		1470	House Garden &c	House &c	- 1 18
			Cae Graig		
Ellis Richard	Morris Richard	1460	Pen Cae Graig	Arable	1 2 37
		1466	Llainiau	Arable	3 - -
		1467	Cae cefn y Ty	Arable	1 - 17
		1468	Werglodd Fach	Meadow	- 1 32
		1469	Werglodd Fach		- 3 31
		1469a	Werglodd ty diau y ffordd		1 - 16

			Cae Gwyn		
John Ellerker Boulcott Esq.	Joseph Williams	1471	Caer fellin	Arable	3 - 6
		1472	Bryn wrthj y Ty	Pasture	1 1 26
		1466a	Cae Bach	Arable	- 3 14
			Adwyddu		
William Turner Esq.	Evan Evans	1475	Bryn Barcu isa	Pasture	- 3 25
		1475a	Clwt y ffynon	Pasture	- 1 -
			Tithe free land		
		1474			

Table 11: Tithe Schedule of South Side of Traeth Bach (Fig. 4)

Landowner	**Occupier**	**Plan Nos**	**Name and Description of Land and Premesis**	**State of Cultivation**	**Quantities in Statute Measures** **A R P**
Richard Anthony Poole Esq.	William Owen	359	A moiety or Garth	Pasture	31 - -
		360	Meadow	Arable	9 2 11
		361	Meadow	Meadow	2 2 35
		362	Cottage and Piece	Cottage Do	- 1 30
		363	Cottage and Piece	Cottage Do	- 1 18
		364	Lle mun Werglodd	Meadow	2 1 -
		365	Waen	Meadow	5 3 8
		366	Gors		4 2 31
	Robert Jones	360a	Morfa'r Garth	Pasture	15 3 7
		423	Cae Mawr	Arable	2 2 36
		425	Caer Odyn	Arable	3 - 17
		426	Buildings &c	Buildings	- - 37
		427	Bryn Glas	Pasture	10 - 31
		428	Borth Las Ucha	Cottage Do.	- 1 10
		429	Borth Las Isa	Cottage Do.	- - 34
		430	Pen Bryn Las	Cottage Do.	- - 38
		435	Werglodd Lwyn y Bryn	Pasture	2 - 36
		435a	Salt Marsh	Pasture	85 - -
		441a	Part of the Garth	Pasture	31 - 11
Lord Newborough	Silvanus Jones	355	Gors Fawr	Meadow	4 - 3

4.2.5.2 Developments in transport

The crossing of the estuaries at Traeth Mawr and Traeth Bach had always been problematic, and a number of routes are known to have existed where crossings could be made on-foot or by boat (Lloyd 1958, 137-50). A ferry ran across Traeth Bach from Ynysfawr and Craig y Don on the saltings below Penrhyn across to Llandecwyn. It was still working in the 1840's, but did not survive the construction of the current railway and road viaduct known as Pont Briwet (Lewis 1989, 58-60).

A bridge crossing of the Dwyryd was proposed in 1842, although nothing came of this initiative (Lewis 1989, 60). The Cambrian Railways was first formed in 1864 by an amalgamation of four companies

responsible for the Whitchurch to Machynlleth line. A fifth company responsible for the stretch to Aberystwyth joined in 1864, and by 1866 the coast line to Pwllheli had been added by the passing of the Cambrian and Coast Railways (Amalgamation) Act of 5 July 1865, by which take-over of the Aberystwyth and Welsh Coast Railway was effected on 5 August 1866. The west coast stretch of the Cambrian Railways, from Glan Dovey Junction to Pwllheli, was classed as a single branch. It was this line, built largely between 1865 and 1867, which necessitated the construction of a viaduct across the Dwyryd at Traeth Bach.

The bridge was authorised in 1861, and consisted of a combined road and rail bridge. It was opened by the Cambrian Railways on 10th October 1867 (Baughan 1980, 99), and created a transport link from Pwllheli in the north through Porthmadog, Penrhyndeudraeth, Barmouth and on to Glan Dovey Junction, at the east end of the Dyfi estuary. The engineer for the line was initially Benjamin Piercy (1827-1888), who advised on many of the Welsh railways, though many of the final designs were by Henry Coneybeare (1823-1884), who learnt his trade on the Bombay Great Eastern Railway project. The viaduct was constructed of timber, and was of 22 spans of 19ft each. The structure is almost entirely wooden, consisting of piers of four or five piles, with a cross-head timber and diagonals. Timber pile bridges such as these were cheap, and had the advantage of a certain amount of 'give' in them over a boggy river crossing (Gwyn 2006, 164). The crossing had a carriageway for vehicular and passenger traffic, and tolls on the crossing were used to compensate the ferry and land owners whose livelihood the new crossing threatened. A road to connect the crossing to the road between Harlech and Maentwrog from Penrhyndeudraeth was also improved at this time. The bridge was substantially reconstructed in 1932, with the removal of and replacement of 'practically half the piles in the frames carrying the superstructure' (Tourret 2003, 65-66), and was enclosed with timber piling constructed of former railway sleepers (Rear and Williams 1988, illustration Penrhyndeudraeth page).

The establishment of Cooke's explosives factory at Penrhyndeudraeth in 1872 provided a considerable amount of freight traffic for this line, in addition to the passenger traffic (Rear and Williams 1994, Fig. 2). A photographic record of the explosive works was undertaken on its closure by the *Royal Commission on Ancient and Historical Monuments for Wales* (RCAHMW, Coflein on-line database).

4.3 Statutory and non-statutory designations

The study area is located partly within the Snowdonia National Park. It is also situated within the Ardudwy Landscape of Outstanding Historic Interest (Ref: HLW (Gw) 2, No. 20), which is described as an area retaining '*a natural integrity as a territory, probably since prehistoric times, because topography has strongly constrained both access and settlement in the area. It also has an exceptional wealth of relict archaeological remains, from the prehistoric period to the recent past, reflecting recurrent human activity in an area with juxtaposed resources of lowland and upland and, not least, the easy availability and survival of stone as a building material.*' (ICOMOS/Cadw 1998, 73). The area lies within the Morfa Harlech Site of Special Scientific Interest (SSSI; ref; 31WNT) and the Pen Llyn a'r Sarnau Special Area of Conservation (SAC).

Pont Briwet itself is a Grade II listed building. There are no Scheduled Ancient Monuments within 500m of the development. A number of post-medieval Grade II listed buildings are located in the village of Penrhyndeudraeth from about 120m west of the northern end of the proposed road improvement scheme, although none will be directly affected by it, and the effect of the road improvements on them will be minimal. These are the Parish church of the Holy Trinity, Penrhyndeudraeth (SH 61143883, ref 26852), the vicarage (SH 61073877, ref 26853), former coach house at the vicarage (SH 61033876, ref 26854) and Gorffwysfa Chapel (SH 60983378, ref 26855).

An area of land north of the toll house at Pont Briwet to both the east and west of the railway line, and centred on NGR SH 6184 3843 forms part of wider National Trust owned and covenanted land which extends as far north as Penrhyndeudraeth Station (Fig. 2), as defined in Volume 11 Section 3, Annex 2, paragraph 2.13 of the DMRB manual. This land is potentially inalienable, that is declared 'objects that the Trust holds in perpetuity and which cannot be removed from the Trusts' ownership without their consent except by special parliamentary procedure' (DMRB Vol 11 Section 3, Annex 2, A2/3). The covenanted

land, mainly to the west of railway line, has a legal agreement in place between the landowner and the National Trust which permanently limits the uses of the land in order to protect its environmental condition, but does not change ownership.

5 ARCHAEOLOGICAL FINDINGS AND RECOMMENDATIONS

5.1 Introduction

The sites included in the gazetteer are those elements of the cultural landscape identified during the assessment which are within the corridor of interest. They are described under the categories of Archaeological Remains, Historic Buildings and Historic Landscapes. The Archaeological Value of some sites may be difficult to assess from current evidence. If this is the case a recommendation will be made for Further Evaluation so that sufficient information can be obtained to ensure the Archaeological Value can be correctly assessed. If the Archaeological Value of the site can be assessed then Mitigation Measures will be recommended.

Each description is accompanied by scores or recommendations for:

- Archaeological Value
- Magnitude of Impact prior to mitigation
- Significance of Effect prior to migitation
- Recommendations for further assessment (if Archaeological Value cannot be assessed from current evidence)
- Recommendations for mitigation
- Magnitude of Impact with mitigation
- Significance of Effect with migitation

(See Section 3 above for definitions of the categories as given in The *Design Manual for Roads and Bridges Volume 11, Section 3, Part 2).*

The features were identified directly within or contiguous with the proposed development area, defined as the development area shown on fig. 1 and a 100m corridor around it.
The recommendations reflect the information currently provided by the client , and assume impact only within the defined proposed development area (as shown on fig. 1). Any change to the boundary of the proposed development area may require the recommendations below to be changed also.

5.2 Archaeological Remains

Feature 2 Wharf (Plate 2) SH 61883841
A wharf, probably used by ferry boats crossing Traeth Bach prior to the construction of Pont Briwet. It is of unknown date but may be 19th century. It is constructed of braced timber piling, and it is of significance for its role in early transport links and crossing of the Traeth. It is currently inaccessible on a triangle of land between the railway line and Traeth Bach.

Archaeological Value	*Medium*
Magnitude of impact prior to mitigation	*Moderate*
Significance of effect prior to mitigation	*Moderate*
Recommendation for mitigatory measures	*Detailed recording*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Slight*

Feature 3 Groynes SH 61873807

Four timber and concrete groynes protect the south-west side of the slate embankment and bridge abutment of Pont Briwet.

Archaeological Value	*Low*
Magnitude of impact prior to mitigation	*Moderate*
Significance of effect prior to mitigation	*Slight*
Recommendation for mitigatory measures	*Basic recording*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Slight*

Feature 5 Slate Gate Piers (Plate 6) SH 61893832

Two slate gate piers, approximately 1.2m high, are probably the piers that held the former toll gate across the carriageway.

Archaeological Value	*Medium*
Magnitude of impact prior to mitigation	*Major*
Significance of effect prior to mitigation	*Moderate*
Recommendation for mitigatory measures	*Basic recording*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Slight*

Feature 6 Boundary Walls SH 61443883

Boundary walls located adjacent to the southern approach carriageway, constructed of uncoursed rubble.

Archaeological Value	*Low*
Magnitude of impact prior to mitigation	*Major*
Significance of effect prior to mitigation	*Moderate*
Recommendation for mitigatory measures	*Basic recording*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Slight*

Feature 12 Boundary Walls on Cambrian View (Plates 11 and 12) SH 61283883-SH61233889

Boundary walls located on the southern edges of Cambrian View will be affected by alterations to the road layout in this part of the scheme. These are built in a number of phases. In the south west corner is a 12m section of granite block walling up to 0.9m high and 0.6m wide, which appears to be 20th century in date, and to have been built after alterations to the road junction opposite Penrhyndeudraeth Station. To the north of this the nature of the walling changes to shale slabs, with cock and hen capping stones surviving for 50m northwards. This is 0.9m high on the road side and 1.3m on the storage yard side, and is damaged in places. On the east side of the road a modern mortared shale slab wall 0.7m high, with post and wire fencing above bounds the modern water pumping station. To the north of this an irregular shale slab wall survives to a height of 2.2m, forming the property boundary wall to *Dorlan*. A limited amount of landscaping will be required on the east side of the road within an area of waste ground now used for storage, but the archaeological effect of this on the surrounding properties is considered to be minimal.

Archaeological Value	*Low*
Magnitude of impact prior to mitigation	*Major*
Significance of effect prior to mitigation	*Moderate*
Recommendation for mitigatory measures	*Basic recording*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Slight*

Areas of unknown archaeological potential
Previous results from similar projects have shown that many sites can only be detected by excavation, however the potential is thought to be low in this case. An intermittent watching brief during the development is therefore a necessary part of the mitigation procedure, with potential for discovering sites that would otherwise go unrecorded.

5.3 Historic Buildings

Levels of building recording recommended refer to those defined in English Heritage *Understanding Historic Buildings: a guide to good recording practice* (2006).

Feature 1 Ty'r Bont (Tollhouse) (Plates 3-4) SH 61883841
A 'T' shaped single storey tollhouse of uncoursed rubble masonry with single lateral chimney on the north side. It probably dates from or soon after the opening of Briwet Bridge in 1865. It is gabled E-W and has a slated roof, with single projecting gable to the south. Four window openings have been noted. A brick porch has been added to the western, carriageway side of the building at a later date, presumably to protect the toll keeper in bad weather.

Archaeological Value	*Medium*
Magnitude of impact prior to mitigation	*Major*
Significance of effect prior to mitigation	*Moderate*
Recommendation for mitigatory measures	*Level 2 Building Recording*
Magnitude of impact with mitigation	*Minor*
Significance of effect with mitigation	*Slight*

Feature 4 Pont Briwet Railway Viaduct (Plates 1-2, 5, 7-10) SH 61933836-61923821
The Pont Briwet railway viaduct was built between 1865-7 for the Aberystwyth and Welsh Coast Railway, which was amalgamated with the Cambrian Railways in 1866. The engineer was originally Benjamin Piercy, who was involved with many of the Welsh railways, and subsequently went on to engineer railways across the world, including France, Italy and Sardinia. He was replaced by Henry Coneybeare, who also worked on many of the Welsh railways, and who provided the final designs for Pont Briwet.

Pont Briwet was constructed of timber, of 22 spans and 19ft wide each. It consists of substantial abutments, at least 40m long, of rough slate blocks [up to 1.8m by 0.6m] which are mortared and battered. The main bridge structure is almost entirely wooden, with the exception of iron bolts and braces, consisting of piers of four or five piles, 0.35m square and about 1.8m tall, with a cross-head timbers and diagonals. A cross beam on each frame, 7.6m long supports the carriageway on substantial length beams supported on short lengths of beam to achieve the correct height, with the length beams being more substantial under the railway track. The decking consists of timber planking. It underwent significant reconstruction in 1932, when half the piles in the frames were replaced. A number of piers and cross-beams have been replaced in more recent times, including one with a date of 1991 on it.

The Cambrian Railway made considerable use of timber bridges to cross the estuaries along its route, and it has been noted that this branch and the connecting Shrewsbury –Aberyswyth line 'incorporate some of the last remaining wooden bridges in Britain' (Gwyn 2006). On the Cambrian Coast Line there are timber bridges surviving at Traeth Mawr, Pont Briwet, Pensarn and Dyfi Junction. On the related Sutton Bridge to Aberystwyth Line there are timber bridges at Caersws, Afon Llyfnant, Cottage, Tre'r Ddol and Afon Leri. There is also a timber bridge at Llwchwr on the Swansea to Llanelli route. There are none known in England, and one in Scotland (Field 2010). There are minor differences between the bridges, both because of original design differences and because of necessary subsequent maintenance. Pont Briwet was the only example designed as a combined rail and toll road bridge

The archaeological value of the structure is assessed as High. This reflects its rarity within the United Kingdon, and its importance as a surviving 19th century combined rail and road bridge.

Archaeological Value	*High; Grade II Listed Building, Ref 26858*
Magnitude of impact prior to mitigation	*Major*
Significance of effect prior to mitigation	*Large*
Recommendation for mitigatory measures	*Preservation in situ, or if that is not possible Detailed Level 4 Building Recording*
Magnitude of impact with mitigation	*Moderate*
Significance of effect with mitigation	*Moderate*

Feature 11 Cooke's Explosives Works Site SH 61683872 C

A former nitro-glycerine explosive works over an area of 28 hectares in use from 1872 until the late 20th cent, consisting of many structures, recorded by the RCHAMW between 1995 and 1999, but now cleared and landscaped.

Archaeological Value	*Low*
Magnitude of impact prior to mitigation	*Negligible*
Significance of effect prior to mitigation	*Slight*
Recommendation for mitigatory measures	*Sympathetic Landscaping*
Magnitude of impact with mitigation	*Negligible*
Significance of effect with mitigation	*Neutral*

5.4 Historic Landscape

5.4.1 Field boundaries

No field boundaries were noted which would be impacted upon by the current scheme.

5.4.2 General Landscape

The development falls partly within the Snowdonia National Park. The southern end of the study are is also situated partly within the Ardudwy Landscape of Outstanding Historic Interest (Ref: HLW (Gw) 2, No. 20), which is described as an area retaining '*a natural integrity as a territory, probably since prehistoric times, because topography has strongly constrained both access and settlement in the area. It also has an exceptional wealth of relict archaeological remains, from the prehistoric period to the recent past, reflecting recurrent human activity in an area with juxtaposed resources of lowland and upland and, not least, the easy availability and survival of stone as a building material*.' (ICOMOS/CADW 1998, 73). The northern part of the study area lies just outside to the south of the Aberglaslyn Landscape of Outstanding Historic Interest (Ref: HLW (Gw) 7, No. 25).

A detailed Historic Landscape Characterisation process was undertaken for the Ardudwy Landscape of Outstanding Historic Interest in 2003. The study area lies within a number of the defined character areas (GAT 2003a and b). The bridge itself lies at the western edge of Character Area 29, Dwyryd valley floor (PRN 18229). The area is described as *flat apart from the series of flood banks which criss-cross the area following the meandering course of the river, and where it is crossed by three bridges, Pont Dol-y-moch (…a scheduled ancient monument), the modern construction which carries the A487 lower down and the 1860s railway bridge* [Pont Briwet] *(part of the Cambrian Coast Railway) near the mouth. Another prominent feature of the lower stretch of the river is the (scheduled) slate quay, Cei Newydd, linked with the earlier phases of the quarries at Blaenau Ffestiniog* (GAT 2003a, 69). The area of road improvement to the north of Pont Briwet lies within the south west of Character Area 26, Intermediate slopes of the Moelwyn range, which is described as a *massive and disparate area. It has been exploited from the medieval period to the 20th century for (limited) agriculture, timber as well as lead and other minerals, and also partly wooded* (*ibid.* 65). The northern end of the proposed road improvement lies within HLC character area 32, Penrhyndeudraeth (PRN 18233), which is described as a village *owing its origins to the*

fishing population which also came to be involved in the pre-railway slate-boating business…with an established community in the early 19th century.

South of the estuary the study area lies partly within Character Area 05, Coed Felinrhyd & Moel Tecwyn (PRN 18238) which includes the upland area of Y Garth (GAT 2003b, 44) described as having *an underlying rocky nature..that was formerly waste and never improved* (GAT 2003b, 44). Crossing the reclaimed land of Traeth Mawr beyond Pont Briwet to its junction with the 1833 Harlech to Maetwrog turnpike the study area lies within Character Area 30, Morfa Harlech- fieldscape (PRN 18263) which is described as an area of improved marsh waste. The Dwyryd valley itself was drained by William Oakley in 1797 (GAT 2003b, 74).

5.4.3 Landscape Survey

The areas identified reflect the different landscape characteristics affected by the proposed improvement scheme, and are therefore not necessarily co-terminus with the Historic Landscape Characterisation (HLC) areas described above. The relationship with the HLC characterisation is discussed in each case. The areas are defined and assessed according to the criteria specified in DMRB 2007, Vol 11 Section 3, Part 2 Annex 7, section 7.9.1 (Fig. 2).

An assessment of the impact upon the Historic Landscape Character Areas will be undertaken in a separate assessment (Assessment of the Significance of the Impact of Development on Historic Landscapes (ASIDOHL)) according to the criteria and guidelines given in *Guide to Good Practice on Using the Register of Landscapes of Historic Interest in Wales in the Planning and Development Process* (Cadw and CCW 2003).

Area 7. Dwyryd valley floor
This consists of parts of HLC area 29, Dwyryd valley floor and part of HLC area 30, Morfa Harlech-fieldscape, and consists of low lying reclaimed estuary and salt marsh. This plain also forms part of the Ardudwy area *Landscape of Outstanding Historic Interest* (Cadw 1998; No. 20). The land use is reclaimed marshland used for grazing and also consists of a wide expanse of sandy estuary.

Archaeological Value	High
Magnitude of Impact	Negligible
Significance of Effect Prior to Mitigation	Slight adverse
Recommended mitigation measures	Sympathetic landscaping
Magnitude of impact with mitigation	Negligible
Significance of effect with mitigation	Slight adverse

Area 8. Y Garth and surrounding area
This area, forming a small part of HLC area 05, Coed Felinrhyd and Moel Tecwyn, consists of unimproved, rocky outcrop to the south east of Traeth Bach, used for grazing. A number of sheepfold are located on the upper slopes.

Archaeological Value	High
Magnitude of Impact	Negligible
Significance of Effect Prior to Mitigation	Slight adverse
Recommended mitigation measures	Sympathetic landscaping
Magnitude of impact with mitigation	Negligible
Significance of effect with mitigation	Slight adverse

Area 9. Western slopes of Moelwyn range
This area forms a small south western part of HLC area 26, Intermediate slopes of the Moelwyn range. It consists of west facing slopes leading town to Traeth bach from Moelwyn to the railway south of Penrhyndeudraeth. The area has been significantly developed, but elements of rocky pastureland survive.

Archaeological Value	Medium
Magnitude of Impact	Negligible
Significance of Effect Prior to Mitigation	Slight adverse
Recommended mitigation measures	Sympathetic landscaping
Magnitude of impact with mitigation	Negligible
Significance of effect with mitigation	Slight adverse

Area 10. Penrhyndeudraeth
This area includes the settlement of Penrhyndeudraeth and includes the built-up area of the former Cooke's Explosive works leading towards Pont Briwet, and is similar in extent to the HLC area 32, Penrhyndeudraeth (GAT 2003a, 72). The village owes its origins to the fishing population which also became involved in the pre-railway slate-boating business. The solicitor David Williams acquired the site of the village in 1841 and carried out drainage on the Traeth (GAT 2003a). The houses are very largely mid to late 19th century in date.

Archaeological Value	High
Magnitude of Impact	Negligible
Significance of Effect Prior to Mitigation	Slight adverse
Recommended mitigation measures	Sympathetic landscaping
Magnitude of impact with mitigation	Negligible
Significance of effect with mitigation	Slight adverse

6 SUMMARY OF IMPACTS AND RECOMMENDATIONS FOR MITIGATION

6.1 Summary of impacts

6.1.1 Individual sites

The following table summarises the archaeological features in the survey area by feature number, the potential impact of the development on these, and recommended mitigatory measures. The sites are located on Fig. 2

Table 13

Number	Name	Value	Impact before mitigation	Significance of effect before mitigation	Mitigation recommendations	Impact with mitigation	Significance of effect with mitigation
1	Ty'r Bont (Tollhouse)	Medium	Major adverse	Moderate adverse	Level 2 Building Record	Minor adverse	Slight Adverse
2	Wharf	Medium	Moderate	Moderate adverse	Detailed Recording	Negligible	Slight Adverse
3	Groynes	Low	Moderate	Slight adverse	Basic Recording	Negligible	Slight Adverse
4	Pont Briwet	High	Major adverse	Large adverse	Preservation *in situ or if this not possible then* Level 4 Building Record	Moderate adverse	Moderate Adverse

5	Slate Gate Piers	Medium	Major adverse	Moderate adverse	Basic Recording	Negligible	Slight Adverse
6	Boundary walls	Low	Major adverse	Moderate adverse	Basic Recording	Negligible	Slight Adverse
7	Dwyryd Valley Floor	High	Negligible	Slight adverse	Sympathetic Landscaping	Negligible	Slight Adverse
8	Y Garth and Surrounding Area	High	Negligible	Slight adverse	Sympathetic Landscaping	Negligible	Slight Adverse
9	Western Slopes of Moelwyn Range	Medium	Negligible	Slight adverse	Sympathetic Landscaping	Negligible	Slight Adverse
10	Penrhyndeudraeth	High	Negligible	Slight adverse	Sympathetic Landscaping	Negligible	Slight Adverse
11	Cooke's Explosives Works Site	Low	Negligible	Slight adverse	Sympathetic Landscaping	Negligible	Neutral
12	Boundary walls on Cambrian View	Low	Major adverse	Moderate adverse	Basic Recording	Negligible	Slight Adverse

6.1.2 General Recommendations

Unknown sites may be identified along the routes which are not indicated on the surface, although the potential for this is thought to be low to medium. In addition to the specific mitigation recommendations outlined above, a watching brief is recommended during the replacement of the bridge structure, and during the road improvements. Much of this, to the south of Pont Briwet, crosses the reclaimed Traeth Bach so the potential for the presence of archaeological remains is considered to be low. To the north of the bridge this may include the removal of boundary walls

It is important that the design of the new bridge reflects the historic landscape in which it is situated.

6.1.3 Impact on the landscape

The direct impact of the proposed bridge replacement on the immediate area should be considered as Major, as defined in 3.4.2 above, since the proposals involve the removal of a listed building (Feature 4) and its associated toll house (Feature 1). The proposals will have a minor impact on the surrounding landscape, however this will involve the removal of some boundary walls as part of road widening to the north west of the former Cooke's explosive works and along Cambrian View.

6.2 Further assessment by field evaluation

Field evaluation is not recommended as part of the improvement. The area affected consists of road verges and areas that are likely to have been heavily disturbed by previous development.

7 GENERAL STATEMENT OF SIGNIFICANCE

The Afon Dwyryd was an important transhipment point in the slate trade from Ffestiniog from the mid 18th century onwards and a number of quays are located upstream of the study area. The study area was also very close to an important crossing point of the river, used for many centuries, of which possible quay remnants have been identified. The low lying land within the estuary has been subject to various phases of reclamation and land improvement from the 18th century onwards, and the settlement at Penrhyndeudraeth developed from the early 19th century.

The ferry which carried passengers across the estuary for centuries was replaced when the Pont Briwet viaduct across the Traeth Bach estuary was constructed in 1865-7 as part of the Cambrian Coast Railway. The new crossing made the ferries redundant, and enabled a road connection to be made between Penrhyndeudraeth and the 1833 Turnpike road between Harlech and Maentwrog.

Pont Briwet bridge is of significance as a surviving 19th century wooden road and railway bridge in Britain (Gwyn 2006, 164; Field 2010). It was of a type specifically employed to cross estuaries on the Cambrian Coast Railway line because of its cheap cost and the 'give' it provided over the boggy river crossings. It is assessed as 'High' in archaeological significance because of its rarity over the network as a whole and its condition. It is acknowledged that many of the timbers have been changed, however this is an expected part of maintenance, and in this instance has not resulted in major impact upon the appearance of the bridge.

8 ARCHIVE

The archive consists of historic maps, plans and photographs, along with notes and digital images taken on the field visit, and is currently held by GAT under project code **G2144**.

A copy of the bound report will be sent to the SNPA archaeologist and to GAPS, and a further copy sent to the HER Archaeologist at the curatorial division of Gwynedd Archaeological Trust, Bangor, for deposition in the Regional HER. A copy of the report will be provided to the National Monument Record, Royal Commission on the Ancient and Historic Monuments of Wales, Aberystwyth.

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9.1 Archival sources

9.1.1 Gwynedd Archives, Dolgellau

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9.1.3 National Library of Wales

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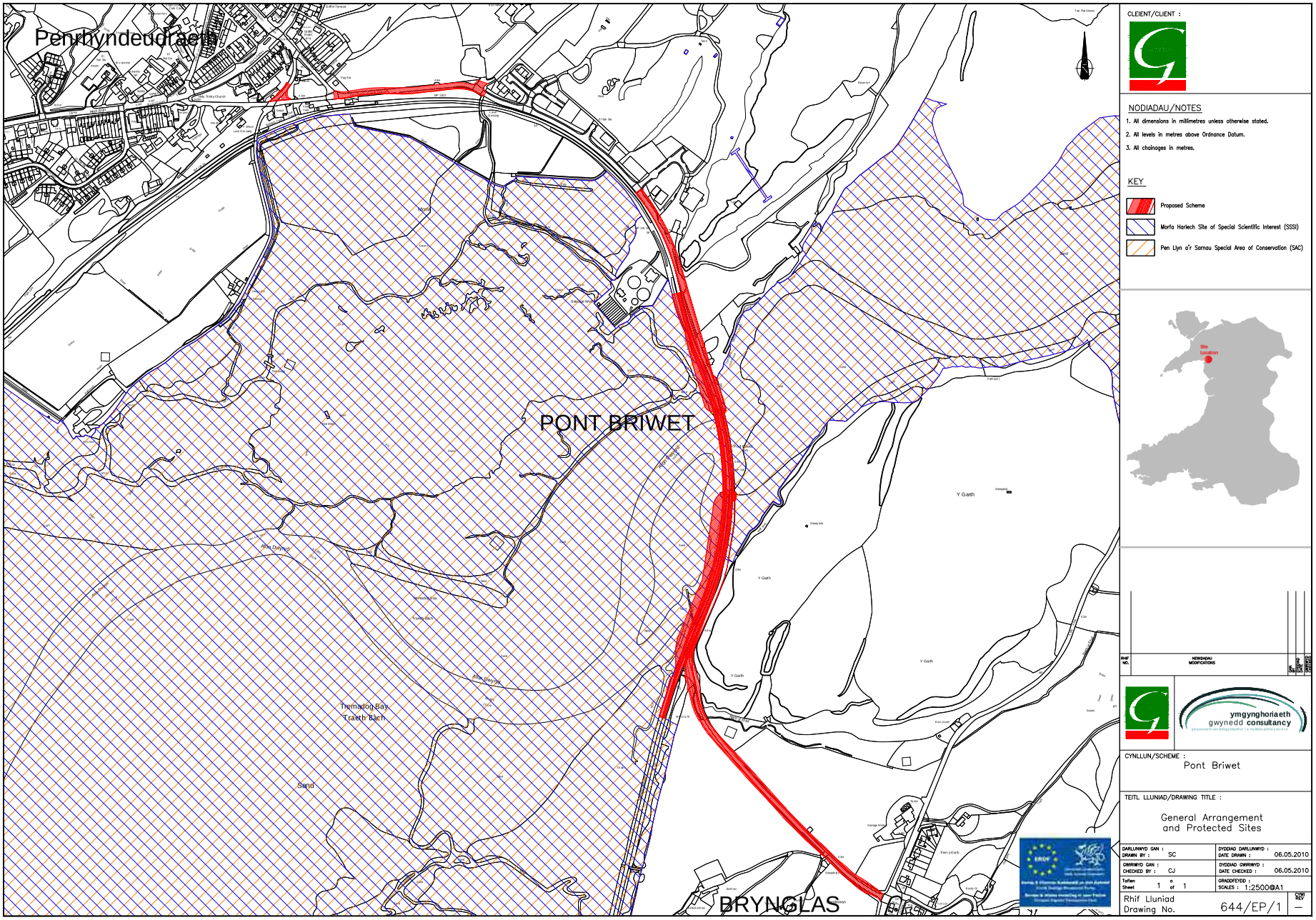

Fig. 1 Site Location, showing proposed route improvements. Base map taken from Gwynedd Consultancy Drawing No. 644/EP/1

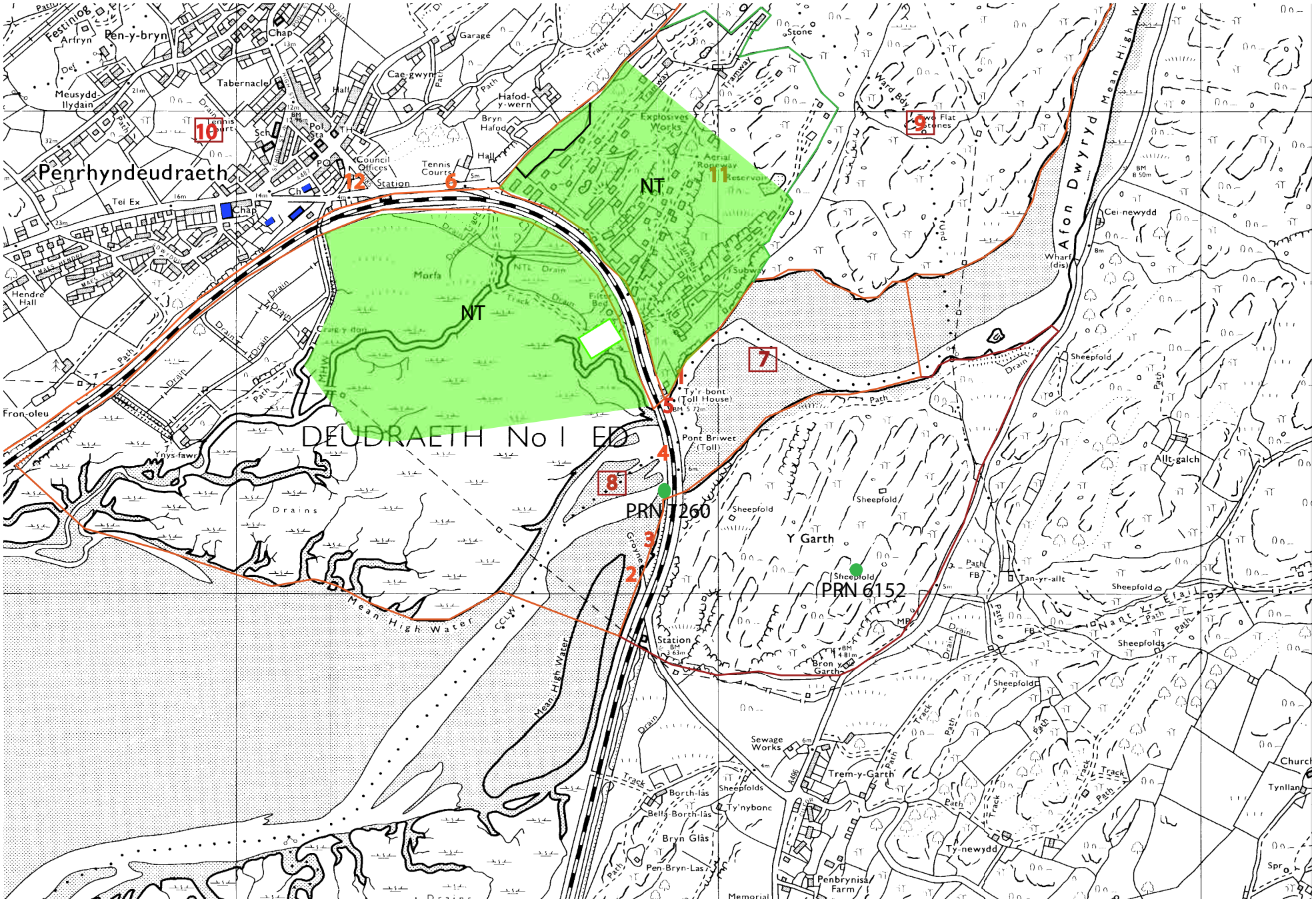

Figure 2. Location of sites noted on the Gwynedd HER (green dots) and on the field survey (numbered). Landscape areas outlined and Listed Buildings shown in blue. Green shaded areas indicate National Trust freehold and Covenented Land. Base map taken from Ordnance Survey 1:10 000 sheet SH78SE. Scale 1:15 000. Crown Copyright Licence No. AL100020895

Fig. 3 Llanfihangel y Traethau and Llandecwyn Tithe map of 1842 Part II showing the northern section of the development overlain in red (Gwynedd Archives).

Fig.4 Llanfihangel y Traethau and Llandecwyn Tithe map of 1842 Part I showing the southern section of the development overlain in red (Gwynedd Archives).

Fig. 5 Ordnance Survey 25 inch 1st edition map of 1889 Merionethshire sheet XI.14 showing Pont Briwet (referred to as Pont Briwfad). Scale 1:7500

Fig. 6 Ordnance Survey 25 inch 2nd edition map of 1900 Merionethshire sheet XI.14 showing Pont Briwet (referrred to as Pont Briwfad). Scale 1:7500

Fig. 7 Approximate location of improvement route, overlain in red on 1770 Survey of Pencraig and Cae Nest Estates...the Property of Owen Anthony Poole Esq. (NLW Maps Vol.2 094/8/3)

Plate 1 General view of Pont Briwet from the north at carriageway level

Plate 2 General view of Pont Briwet from the south at Llandecwyn halt. Site 2 is visible to the west

Plate 3 Ty'r Bont (Tollhouse) from the north west

Plate 4 Ty'r Bont (Tollhouse) from the south

Plate 5 Detail of the possible wharf (Feature 2)

Plate 6 Stone gate piers from which former tollgate hung (Feature 5)

Plate 7 Slate abutment at the southern end of Pont Briwet, from the south east. Scale 1m

Plate 8 Detail of Braced timber piles and supports on Pont Briwet. View from east south east. Scale 1m

Plate 9 Pont Briwet at Traeth Bach level from the south south east showing wooden piers

Plate 10 Pont Briwet from the east

Plate 11 Cambrian View from the south

Plate 12 Boundary wall to the west side of Cambrian View (Feature 12)

APPENDIX 1

Sites located on the Gwynedd HER within 500m of the centre of Pont Briwet

PRN	NPRN	SITENAME	NGR	AREA DESIGNATION	CLASS	SITETYPE	PERIOD	FORM
6152	60967	HUT CIRCLE & WALLING, Y GARTH	SH62293803	Snowdonia National Park	Domestic	HUT CIRCLE	Prehistoric	STONE BUILT FEATURE
7260	64196	RAILWAY BRIDGE AT TALSARNAU	SH61903830	Snowdonia National Park	Transport	BRIDGE	Modern	STANDING MONUMENT

YMDDIRIEDOLAETH
ARCHAEOLEGOL
GWYNEDD

GWYNEDD
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